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ABSTRACT

The importance of the printed word is being questioned with the advent of technological innovations, and in the age of electronics, reading is no longer confined to the printed page. Whether the book shall survive is being questioned as electronic surrogates appear and computer technology alters the publishing process. An entire product can be disseminated by electronic distribution. Theoretical and working models of the electronic book have been developed; they are represented in simple form by the hand-held electronic language dictionaries, and more sophisticated models are available. The ideal electronic book should embody the flexibility and portability of the printed book and even improve on these benefits. If the function and authority of print migrate to other media, a role may still remain for books as printed books permit greater stability and a preservation of textual authority. No matter how rosy the future of electronic information, the questions of textual authority and preservation remain. (Contains 108 references.) (SLD)

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Futures of the Book: A Preliminary History

September 1993

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Where is human nature so weak as in the bookstore!

Henry Ward Beecher (1855)

I cannot live without books.

Thomas Jefferson (1815)

Books are not absolutely dead things, but do contain a potency of life in them to be as active as that soul whose progeny they are; nay they do preserve as in a vial the purest efficacy and extraction of that living intellect that bred them.

John Milton (1644)

Child! do not throw this book about;
Refrain from the unholy pleasure
of cutting all the pictures out!
Preserve it as your chiefest treasure.

Hilaire Belloc (1896)

I believe books will never disappear. It is impossible for it to happen. Of all mankind's diverse tools, undoubtedly the most astonishing are his books . . . If books were to disappear, history would disappear. So would men.

Jorge Luis Borges

Affect not as some do that bookish ambition to be stored with books and have well-furnished libraries, yet keep their heads empty of knowledge; to desire to have many books, and never use them, is like a child that will have a candle burning by him all the while he is sleeping.

Henry Peacham (1622)

'Tis pleasant, sure, to see one's name in print; A book's a book, although there's nothing in't.

Lord Byron (1809)

Another damned, thick, square book! Always scribble, scribble, scribble! Eh, Mr. Gibbon?

William Henry, Duke of Gloucester (1781)

If books did good, the world would have been converted long ago.

George Moore

Most hard-cover books are junk.

Reuel Denney (1955)

People in general do not willingly read, if they can have anything else to amuse them.

Samuel Johnson

A pair of boots outweighs Shakespeare and Pushkin.

Pisarev

Reading and writing will become obsolete skills.

Sol Cornberg

Maybe books will eventually be like horses. At one time everybody used them for transportation. Now they are used only by hobbyists.

Paul Saffo (1989)

Figure 7 A future electronic book. (From Grayson [1980])

Lancaster, 1982

Lancaster, 1982

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What of the Future?

Introduction

The arrival of printed books in western Europe in the mid-fifteenth century created a variety of reactions, among them wonder, fear and scorn. E.P. Goldschmidt describes a trip to Paris by Johann Fust, Gutenberg's financier, in which Fust attempted to sell some of the printed Bibles. "Alarmed at the appearance of an outsider with such an unheard of treasure of books, when he was found to be selling one Bible after another, they soon shouted for the police, giving their expert opinion that such a store of valuable books could be in one man's possession through the help of the devil himself..." (Eisenstein 19) The story may be apocryphal, but "Whether the new art was considered a blessing or a curse, whether it was consigned to the Devil or attributed to God, the fact remains that the initial increase in output did strike contemporary observers as sufficiently remarkable to suggest supernatural intervention..." (Eisenstein 19) Hostility toward printed works in these early years was manifested in other ways, too. A manuscript dealer noted in 1482 that "The Duke of Urbino would be ashamed to have a printed book in his library." (Trenaman 199) According to an Egyptian legend quoted by Plato, even the invention of writing was greeted with scorn because of the effect it would have on memory. (Trenaman 199)

The kind of wonder that printed works spreading throughout Europe in the late fifteenth century must have created in many people has been wonderfully described by Prince Modupe, a west African native:

> I gradually came to understand that the marks on the pages were trapped words. Anyone could learn to decipher the symbols and turn the trapped words loose again into speech. . . I shivered with the intensity of my desire to learn to do this wondrous thing myself. (McLuhan 84)

The importance of this ability of printed works to release the "trapped words" for entertainment and the transmission of knowledge continued virtually unquestioned until the end of the nineteenth century. At that time a series of technological innovations began that to this day has led some to question the role if not the very existence of print and the printed book in Western culture. "In bringing the ancient and medieval world into fusion . . . the printed book created a third world, the modern world, which now encounters a new electric technology or a new extension of man. Electric means of moving information are altering our typographic cultures as sharply as print modified medieval manuscript and scholastic culture." (McLuhan 156) Perhaps we are now in a phase analogous to the incunabula period, in which the new, more open technology of print and the hermetic manuscript culture collided and co-existed for a few decades until something entirely new had emerged.

TECHNOLOGICAL THREATS TO READING

Until quite recently threats to the book were discussed as threats to reading, either the reading of "good" materials or any kind of reading at all. The printed book's existence as a physical object was not an issue. In the late nineteenth century a debate raged in the United States over the appropriateness of popular fiction in public libraries: wouldn't cheap fiction further erode the moral condition of those very lower classes public libraries were meant to uplift? At about the same time certain technological developments were entering American daily life and were quickly seen as dangers to reading.

Perhaps the first technology to be perceived as challenging the printed word was the bicycle. "In 1896 the bicycle was the first to scratch the sensitive skin of the literary world. Frank Stoddard at that time wrote a letter to his publisher pointing out that the bicycle seemed to be here to stay and it would surely ruin the reading of books. He suggested that publishers and authors put a tax on bicycles to protect themselves." (Brahm 594)

Early in the twentieth century magazine articles began to complain about "Interferences with the reading habit" (Lee, 1902), "The lost art of reading" (Lee, 1903) and the "Decline of book-buying." (Anon., 1980) By 1924 several other diversions by technology from reading were identified. "As a barrier to the reading of books, we are thoroly (sic) familiar with the influence of the automobile," one writer noted, further bemoaning "... the actual loss in reading desire and reading accomplishment caused by this remarkable development of the motor car as the family caravan." (Sherman 75) This writer also cataloged the distractions from reading afforded by motion pictures and radio, about which he intoned, "The whole family comes under its spell. There are thousands of individuals who appear to be quite bewitched by this instrument and its mysterious power." (Sherman 76)

Finally, Sherman noted a phenomenon of his day that has been echoed by many subsequent commentators on the place of reading in modern western culture; he said "... that the distractions of this age of jazz have condemned our reading public to become a race of light and occasional rather than regular and intensive readers." (Sherman 76) Since World War II similar fears about the effect of television on reading have been expressed and studied frequently (Anon., 1951 and 1954; Cole, 1978; Kaiser, 1951 and 1952; Robinson; Stanton) Some of these fears may be well-founded; in late 1990 a Gallup poll found that 39% of people surveyed would use their time to read if their television sets were taken away. (Gallup, 1990)

Individuals concerned about the effects of new technologies have often found that these may actually stimulate reading or can be so used. In 1939 the Saturday Review of Literature editorialized that the ". . . dismal prophecy. . . that movies,, radio, and picture magazines are killing books . . . is becoming commonplace. The next time somebody makes this statement, we should be glad to see him accompany it with evidence. All the evidence we've seen is on the other side." (Anon., 1939) By the late 1930s librarians were utilizing radio to interest children in reading. (Sauer) In 1937 the Rockefeller Foundation started the Princeton Radio Research Project ". . . to study the effects of radio upon American cultural life" and found ". . . that radio listening does stimulate reading." (Curtis 11) Another survey of this period asked rural women where they heard about books they requested at the library and gave ". . . the same reply, 'Radio.'" (Curtis 11)

In the early 1970s a study in Great Britain that measured library demand for the novels adapted for television by the B.B.C. ". . . showed that three months after the broadcasts the demand was still above normal, and in one instance nearly twice the normal figure. Another interesting finding was that the demand for other novels by these same authors also increased to about double the pre-broadcast

rate." (Trenaman 203) Various contemporary programs such as Reading Rainbow and the Library of Congress/CBS "Real All About It" cooperative venture are testament to the belief that the visual technology of television can be used to stimulate interest in the printed word. Further evidence is provided by the large sales of books tied to such PBS series as The Ascent of Man, Cosmos, Eyes on the Prize and The Civil War. Bronk contends that ". . . through these media a wide audience is exposed to new ideas which lure the more curious to new areas of reading." (Bronk 130) Barnouw is not so sanguine; he notes that many mass market paperbacks "... echo television. Such books constantly recycle fiction that has been successful in television adaptations and present new fiction designed for similar recycling... Much of the book industry dances around the television maypole." (Barnouw 40)

Another threat to the book identified by some writers is ironically the overabundance of books in our society. This complaint is hardly a new one; after all, Ecclesiastes railed against the endless making of books. In 1613 Barnanby Rich intoned, "One of the diseases of this age is the multiplicity of books; they doth so overcharge the world that it is not able to digest the abundance of idle matter that is every day hatched and brought forth into the world." Naturally Rich failed to heed his own advice and published over 25 books and pamphlets! Winger says, "...undeniably the book brought some distressing changes in man's crusted intellectual environment. Knowledge pressed in on him from the past and from the far places beyond the reach of the human voice. The pressure was unremitting and insistent..." (Winger 13)

Jacques Barzun tells the story of Charles Lamb, who "...wrote against books that were nonbooks, biblia abiblia... guide books, digests...reports, tracts and polemics of all kinds... He felt so strongly that these tended to overshadow real

books, drive them out of circulation-bury them alive-that when he came across a true book, he would kiss it." (Barzun 141) Barzun himself observes, "...we are producing books at such a rate and with so little regard for their substance that the true expressions of mind and feeling which are bound to be somewhere in the giant heap are practically invisible." (Barzun 142) He bleakly notes that our culture doesn't have to burn books; we simply bury them under more books. (Barzun 148)

Now that the activity has undergone a century of unrelenting competition from mechanical, aural and visual sources, what do we know about the state of reading in America? In 1951 one author noted that between 25 and 30% of adults read one or more books per month. (Gitler 376) A recent Gallup poll found that 24% of respondents had completed a book in the previous week, a figure that was down 6% from the results in a 1975 survey. (Gallup, 1991)

The study of reading has been a growth industry since World War II, but the results are problematic. Books with titles like Reading's Future in the Seventies (Sponseller and Carlson), The Future of Literacy (Disch), Reading, What of the Future (Moyle) and Who Reads Literature? The Future of the United States as a Nation of Readers (Zill) are ubiquitous. Goodrum and Dalrymple have reviewed much of this reading research. "There have been many surveys, studies, and polls over the years, but they are generally not comparable because they use different parameters in defining what a book reader is. Or, they may look at a single segment of the reading public, concentrating only on newspapers and magazines." (Goodrum and Dalrymple 107) Gallup polls conducted since the late 1930s do show that the percentage of "regular readers of books" has ranged from a low of 17 in 1958 to 59 in 1978 with most of the numbers in the 20s. (Goodrum and Dalrymple 180) Reading is also a significant activity among young people; only sports rated higher among their hobbies in one survey. (Goodrum and Dalyrumple

110) Various social, gender and life-style factors are known to correlate with reading. (Boorstin 366)

These surveys are often very liberal in what can be considered "book" reading; completion of a book is not even required in some polls and studies. (Goodrum and Dalrymbple 107-108) In addition, some poll respondents may be giving interviewers idealistic answers; "How many people especially those with a college education, are going to admit that they haven't read a book in the last six months?" (Goodrum and Dalrymple 108) Boorstin has noted that "...when people are asked they seldom underestimate their reading." (Boorstin 361) Despite the fact that more than five million books are purchased in the U.S. every year, "We appear to be a nation that can be excited by a book-but not easily." (Goodrum and Dalrymple 110) How has reading remained as prominent an activity over the decades as it has, despite the assault from other leisure pursuits? "Productivity of leisure hours seems to have increased as much as productivity of work hours. In our technological society, time seems to have become uncannily elastic. People do more these days." (Boorstin 364)

Not all critics of American culture are impressed with the act or status or reading. "Although people...may admire books as decorative objects, the act of reading is rarely taken seriously." (Jennings 7) Reading can too easily be associated with homework, tests and viewed as an antisocial or elitist behavior. (Peterson 95) One satirist has described the future elimination of reading when it is found to cause the common cold. (Gordon) Donald Hall stated flatly, "People surround the idea of reading with piety... But this piety is silly, and most reading is no more cultural or intellectual or imaginative than shooting pool or watching 'What's My Line?'" (Hall)

Observers who are concerned with "cultural or intellectual or imaginative" reading find little in contemporary western societies to encourage them. The noise and haste and multiple distractions of modern life make such "deep" reading a difficult activity to undertake-" ...almost nothing in our culture encourages the private moment of reading." (Lapham 38)

Such a worry is hardly new. "A multitude of causes unknown to former times are now acting with a combined force to blunt the discriminating powers of the mind and unfitting it for all voluntary exertion..." Wordsworth declared in 1802. "The faculty of attention has utterly vanished from the general Anglo-Saxon mind, extinguished at its source by big, blatant journalism, the newspaper and the picture magazine..." Henry James agreed in 1902. (Heiskell 1577) A magazine article of 1903 said there was simply "No time to read." (Anon., 1903)

In our own day others have described this state of affairs. "We read to enter into discourse, dialectic, and dialogue with someone as obsessed with an idea or subject as we are." (Pellegrino 87) But "The clan of readers, readers in the old sense, may become a fairly small one..." (Steiner, 1985, 48) Reading in the "...private, silent sense...may become as specialized a skill...as it was in the scriptoria and libraries of the monasteries during the so-called Dark Ages." (Steiner, 1985, 48) Today

> Intensities of light and noise levels of an unprecedented volume crowd in on personal space, particularly in the urban home. Far more often than not, the act of reading takes place against, in direct competition with another medium - television, radio, the record player. There are almost no taboo-spaces or sacrosanct hours left in the modern family. All is free zone. (Steiner, 1978, 189)

Another problem related to reading and the book is the increasing balkanization of public discourse into "...the economic and ideological requirements of popular culture and academia." (Agger 34) We have books that are "textless"

but bookstores "busy" (Agger) with buyers of objects "...indistinguishable from a seasonal toy." (Lapham 37) "More and more of our verbal inheritance is caught between semi-literary of the mass market and the Byzantine minutiae of the specialist" (Steiner, 1978, 194), "the saturations of the mass media" and "the saturations of learned print." (Denney 100) "...the way we have arranged our literary worlds, both in trade publishing and popular culture...and in academia" has led to a "literary commodification" that "has quickened to the point that books themselves have disappeared, eroding the public sphere essential for democracy still further." (Agger 97) "The reading and writing public has declined largely because readers and writers have gone elsewhere; their discourse has been displaced ...intelligence has been removed from traditional literary culture into other realms, notably popular culture and academia...intellectuals are sucked into institutions either supporting power directly (academia and the professions) or diverting and anesthetizing people (popular culture)." (Agger 34) If one accepts these points as valid, the implications for the future of the "community of the book" (Vaughan) could be profound, since the discourse of both popular culture and academia is increasingly shifted into media other than print and the book.

One final issue must be addressed before leaving this section on reading and moving into the brave new world of the electronic "book." Much public agonizing is currently underway over the illiterates and alliterates of our society (Boorstin) and the newly-recognized cultural illiterates (Hirsch). However, "The appropriate skills for literacy...have changed over time." (Compaine 128) In various cultures to be literate meant being able to develop and recite oral compositions, to know Latin or to simply sign one's name. (Compaine 128 and 134) Compaine has pointed out that "...school-children of today are developing a new set of skills that may lead to a different standard of literacy..." because they learn and play so much in the video

realm. (Compaine 131) "Even if the video game craze is itself a fad, it nonetheless may have considerable cultural significance, much as the dime novel or penny press had in earlier eras. For the first time, it has made the video tube into something other that a passive format for the masses." (Compaine 130) Lanham notes simply that "...We really must cease conducting the whole 'literacy' debate on the basis of a print technology which is even now in radical metamorphosis." (Lanham 41) Even the ubiquitous futurist Alvin Toffler has spoken on this topic. "We assume you have to teach everybody to read and write; maybe that assumption will change... I do think we have to re-conceptualize literacy in the light of...speech [recognition] technology, reading machines and artificial intelligence." (Koenenn 1989a) Perhaps we are now witnessing the sort of dislocations of consciousness that occur with major cultural shifts such as the replacement of the papyrus roll by the codex and the manuscript book's replacement by the printed one.

However, warning flags about the new literacy are being raised:

> A technocratic society can thrive on computer literacy; a democratic society cannot, for a democratic society demands independent minds capable of critical thought. A great many citizens will undoubtedly be advantaged by computer learning. But we will always need a cadre who can rise above the program...to be beacons warning the rest of us when we run close to the inhumane shoals of a programmed existence. (Pellegrino 88)

ELECTRONIC "BOOKS" AND BEYOND

"For much of their history, books have been controversial because of their content... But in the last part of the 20th century a different sort of controversy surrounds the book. It has to do not with the content of books, but with their form. In an age when new electronic channels of communication are taking hold, the question being heard is: Will the book survive?" (Sigel 9) Perhaps not. "The book as we know it is an essentially passive device, merely transferring information from one mind, that of the author, to another mind, that of the reader. But the book of the 1980s will no longer be passive, for it will be a sifter and interpreter as well as a purveyor of information." (Evans 109)

Electronic assaults on the printed word have their genesis at the end of World War II. In 1945 Vannevar Bush described what he called "memex," "...a device in which an individual stores all his books, records and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility." (Bush, 1945) Bush's essay anticipated by several decades such recent innovations for the manipulation of text as on-line bibliographic databases, "windows," and "hypertext" or "hypermedia."

In 1955 another writer echoed Bush's vision.

> ...my favorite solution for the problem...of access. This is to seal one copy of everything in concrete in a big hole in Kentucky. Next to each copy would be sealed a scanning device. To consult the item, the user would merely dial the appropriate number, and the item would be shown on his television screen. Simple controls would enable him to flip the pages; and, of course, any number of persons could consult the same item simultaneously! Perhaps the idea is not so extravagant as it sounds, especially since we already have three of the components - the books, the television screens and the big hole in Kentucky. Shouldn't we ask the engineers to go on from there? (Clapp 76)

Five years later, a graduate student at Harvard named Ted Nelson was inspired by Bush's work and conceived "Xanadu," "...a computerized repository of human knowledge - with any document, image, animation, or note of music instantly accessible to anyone, anywhere... Nelson devised a wish list for Xanadu. Then he set about to make it a reality, writing thousands of lines of code in the early '60s... In 1964, Nelson came up with the term hypertext for the nonsequential writing with free user movement made possible by Xanadu." (Ditlea) During the 1980s Bush's "dream of the memex" (Rice) has begun to take shape in actual devices approximating element's of his vision and that of Nelson.

In the past two decades electronic surrogates for the printed word have been appearing at an ever faster rate. By the early 1980s individuals could search vast bibliographic databases at locations remote from the computer on which the files were mounted. On-line versions were beginning to challenge the traditional card catalog in libraries. And "personal" computers with more power than the room-sized behemoths of the past were appearing on desktops at home and work, where users could build their own databases, manipulate text with word "processors" and turn their screens into battlegrounds for Space Invaders and PacMan.

Now we face an even larger universe of electronic information sources. Earlier trends have developed further and new technologies have appeared. In 1970 Spectorsky wrote, "It seems to me possible that within ten years - and probable within twenty years - there will be a new medium, just as television was a new medium at one time, which will be a combination and synthesis of all extant forms of communication and entertainment and information, and of all the arts..." (Spectorsky 54) We have reached his two decade mark and instead of a single new medium, we confront an electronic tower of babel-numerous technologies

inside and outside the world of print, with which words or pictures can be created, stored and distributed.

Computer technology has entered every step of the publishing process of conventional books and journals. Many authors now create electronic drafts which are mailed or otherwise transmitted to the publisher, where further editing may be done electronically. The publisher can then transfer this material to the printer via disks or phone lines and computer-driven photo composition equipment is used to produce a "hard" or printed copy. Thus every stage can be electronic except the final one; the computers speed and flexibility are used to streamline a traditional printing process. As much as fifty percent of the time needed to bring out a book can be cut using this technology. (Goodrum and Dalrymple 154) "Michael Wiese in Westport, Connecticut, typed his own books and sent the word processing disks to a nearby printer who slipped them into its interfacing machine. The digital interface automatically separated the words into pre-designed pages, made the plates, and printed them in Times Roman typeface. The result was two books...that gave the appearance of traditional publishing house format at a fraction of traditional costs." (Goodrum and Dalrymple 154) So-called "desktop publishing" software such as Pagemaker and Ventura Publisher have in the last few years brought this sort of sophisticated design capability to the individual's computer. (Lewis)

Since these "texts" are in digital form, the final product - a book or journal - can be supplemented or supplanted entirely by electronic distribution. In November 1982 Canadian novelist Burke Campbell distributed his 20,000 word Blind Pharoah directly from his computer to subscribers of The Source commercial network. (Jennings 10) Today other commercial networks - such as CompuServe, The Well and Delphi as well as large, non-profit equivalents like Bitnet and Internet form an international "matrix" (Quarterman) over which vast amounts of formal and informal

written communication are moving daily without the use of print. These networks include discussion groups on every conceivable topic, private or professional, as well as a growing number of truly-electronic journals, amateur and refereed, that are not issued in printed form.

On-line bibliographic databases searched remotely have expanded in number and "full-text" databases containing complete electronic versions of printed journals and books have been added to the offerings of many vendors and can be searched with the same powerful commands. One authority puts the current numbers at 5600 databases available from more than 850 sources. (Tenor)

Electronic equivalents or variations of printed texts are proliferating rapidly. An electronic anthology, the Complete Writer's Tookit, provides the American Heritage Electronic Dictionary, the Roget's II Electronic Thesaurus, the Abbreviations Expander, the Concise Columbia Dictionary of Quotations, and the Written Word III, a grammar and style reference, at a suggested retail price of $129! (Shannon) "Digital books" such as the Merriam-Webster Dictionary, the Oxford Dictionary of Quotations and the works of Shakespeare have been bundled with the operating software of the NEXT computer. Texts of this type such as the Frank Netter/CIBA Atlas of Human Anatomy as well as bibliographic databases such as MEDLINE are also being issued on CD-ROM. In addition to a number of commercial vendors operating in this area, Project Gutenberg at the University of Illinois has the ambitious goal "...to provide a collection of 10,000 of the most used books by the year 2000, and to reduce...the effective costs to the user to a price of approximately one cent per book, plus the cost of media and of shipping and handling. Thus we hope the entire cost of libraries of this nature will be about $100 plus the price of the disks...and mailing... These electronic books will not have to be rebound, reprinted, reshelved, etc. They will not have to be reserved

and restricted to use by one patron at a time. All materials will be available to all patrons from all locations at all times." (Hart) The first title in this effort is Carroll's Alice in Wonderland. In 1990 one enterprising high school in Eugene, Oregon, issued a CD-ROM version of its yearbook that included text, photos and "...even recorded voices of students." (Kelly)

Other "texts" more or less unique to the electronic environment are also being developed. Interactive versions of science-fiction and fantasy novels by Arthur C. Clarke and Byron Preiss have appeared, as well as children's stories by Mercer Meyer, author of numerous Little Golden Books. (Goodrum and Dalrymple 177) A number of games of this type have also been released. In these interactive fictions or games, the reader/player becomes part of the action, and the story proceeds based on choices he makes. A crude print equivalent was tried by Bantam Books in its "Choose Your Own Adventure" series released in the early 1980s. (Jennings 8)

Interactive fiction, as well as such categories as auto repair and crafts manuals and travel and cooking "texts" that are now so popular on videotape, would seem ideally suited for the video or optical disk medium. (Goodrum and Dalrymple 160) However, since the failure of the RCA videodisc player of a decade ago, the home market for this technology is currently dormant and the current activity in this area is at the institutional level. The Library of Congress American Memory project promises to be "...electronic copies...of photographs, manuscripts, music, motion pictures, books and sound recordings" (Library of Congress) - in other words, fifteen to twenty anthologies released at a rate of two or three per year. Another similar effort is the "Slice of Life" videodisc which "...is now in its fifth edition and is a compilation of 40,000 contributed images from over 190

people at 46 institutions, and is in use at Medical School Libraries and Learning Resource Centers in over 150 institutions." (Eccles)

Over the past three decades various theoretical and working models of the true electronic "book" have developed. In the early 1960s Alan Kay and Ed Cheadle at the University of Utah designed a protopersonal computer called FLEX. "From FLEX it was a quick hop, in Kay's mind, to a truly personal, portable, powerful computer that would become as ubiquitous as TV sets and almost as easy to operate. Kay envisioned it as something the size of a three-ring binder, something a kid could carry around easily. He called it the Dynabook." (Sobel 82) Kay spent most of the 1970s at Xerox's Palo Alto Research Center "...trying to bring the Dynabook to life." (Sobel 82) He has since worked at Atari, MIT's Media Lab and Apple Computers.

In the 1980s several other visions of such a device have appeared. In 1980 Evans predicted that "The read-out terminals of the late '80s will be about the size of the average book today... The screens on which the text is displayed will vary in size depending upon what one wants, page-size for the hand-held book, wrist-size for quick reference and portability, a ceiling projection for reading in bed...The speed of text generation will be variable with automatic 'page turning' as a standard feature...and a variety of different typefaces...The chips themselves, each containing a book or set of books, will of course be easily interchangeable." (Evans 108) Although not all of Evans predictions have yet been realized, his vision of ten years ago was quite accurate in several respects, as we will see shortly.

Also in 1980 Arthur C. Clarke described "...the portable electronic library - a library not only of books, but of films and music. It will be about the size of an average book and will probably open in the same way... Whole additional libraries stored in small, plug-in memory modules, could be inserted into the portable library

when necessary... Reading material may be displayed as a fixed page or else 'scrolled' so that it rolls upward at a comfortable reading rate." (Lancaster 57)

Lancaster has discussed an "electrobook," an electronic reference work "...in the form of a hand-held microprocessor." (Lancaster 57) Toffler describes an "electronic reader' that "...will be a book-sized electronic screen and you will slip an automated card into it and read it... The reader will be able to adjust the type size...and change the type font. You can instantly go back and locate the first appearance or background of any fictional character... You can increase or decrease the level of vocabulary difficulty. You will be able to call up alternative versions of a novel targeted at different reader groups by age, occupation, geography and sex... Basically, I am saying they can customize the text." (Koenenn 1989a)

Gary Warner, systems programmer at Samford University, has envisioned "...a hand-held with a two-page paperback display..." that would interface by modem with a "megabook," a digital library with sophisticated multimedia capabilities. The device "...should be a round environment hand-held so you can take it anywhere with you... It would be possible to download several books at a time to the same unit. Page 1 of each book would have a book mark stored at it..." (Cox) Researchers at the University of York in England have recently developed computer-assisted learning software they call a book emulator, or dynamic electronic book, that is designed to recreate the positives of learning from books. (Benest)

Versions of Lancaster's "electrobook" have been appearing since the early 1980s in the form of hand-held English and foreign language dictionaries. Current versions include two from Berlitz, the EuroTraveller and the Interpreter. The former handles 1700 phrases in ten languages; the Interpreter offers 12,500 words in five languages.

More sophisticated electronic "books" are also entering the marketplace. Xiamax 2 is "...a two-pound rectangular box with a keyboard on its face. Through the wonders of data compression, the user can pop one or more credit card-sized microcards into this gizmo and obtain a liquid crystal display of whichever books Xiamax has obtained the rights to squeeze into bytes and bits...[the device offers] word and phrase finding, underlining, highlighting, print enlargements, and the capability of making simple links from one text to another. Xiamax's Bible study package, for instance, allows the user to shuttle between text and explication or text and Greek and Hebrew translations." (Handman 147) The unit retails for $449.95. Late in 1990 the Data Discman was released in Japan by the Sony Corporation, which is calling the unit "...the future of the book... Somewhat similar to a palm-sized computer, with a screen a little smaller than a business card and a miniature keyboard, the new gadget displays pages of books on its screen, flipping to new pages in response to the user's typed commands. The Discman costs about $350; books, in the form of 3.5 inch optical disks that are inserted into the display machine, range from $15 to $50... There are currently about 25 different books available ...Most are reference works...that use the built-in searching software as a fast electronic index..." (Reid)

The future of the electronic "book" will no doubt be aided by continuing improvements in computer storage and display technology. A healthy portion of the computer marketplace at the moment is a class of machines known as "palmtops" - units about the size of large electronic calculators. On April 22, 1991, Hewlett-Packard announced the release of the 95LX, a palmtop that will retail for $699. The new H-P is IBM-compatible, will include the popular Lotus 1-2-3 spreadsheet software and has the same computing power of the original IBM-XT, a 23-pound machine introduced in 1985. The 95LX also has communication

capabilities. (Markhoff; Rebello) At the same time AT&T announced its intentions to offer within a year a "Smart Phone" with built-in computer that will sell in the $150-200 range. The unit will be designed for use with hope shopping and banking services. Citicorp tested a similar device, the Enhanced Telephone. "We have disguised a computer to look like a telephone," said Susan Weeks, a spokeswoman for the bank..." (Shapiro C5) These and similar products will increase even further the penetration of computers into the American social fabric. Historian Barbara Tuchman has claimed that "You can't take a computer to bed or to the beach." (Goodrum and Dalrymple) Well, now we can. Perhaps one day we will actually want to do so!

Many characteristics of an ideal electronic book have been discussed in recent years. All of these qualities would either imitate the flexibility and portability of the printed book or improve upon them. "Woody Horton...has proposed a test publishers and readers can apply to determine how satisfactorily material, now normally supplied in book dorm might be displayed on a video monitor... Horton's test includes rating both intellectual and emotional factors, and considering the objectives of both producers and users of the material in question." (Jennings 9)

Specific qualities cover numerous aspects. "With a visual image identical to the high quality associated with the printed word, the electronic book doesn't cause eyestrain. Even the graphics don't look like computer graphics. Photographs look like real photographs. The technology is so refined that even art books look great." (Abrams) These elements will help overcome complaints about screen technology - "...an unpleasant visual medium, limited screen size, and the need for a machine to read the material at all - [that] are shared by microforms. The fact that after several decades microforms are still disliked by the great majority of readers

suggests that the computer or television screen may be no more acceptable as a medium for reading." (Line 32)

A 1991 discussion on the Public Access Computer Systems forum available via the Internet system covered the reading of electronic "books." Desired elements included the ability to easily access more than one text at a time, as well as citations made by any of those texts. "Reading online must be a pleasurable experience. We lose the tactile experience of holding paper, so something must take its place... Perhaps it could be padded... Provide book markers... Provide the ability to write in the margins, to be kept as a separate file that I can overlay...programmable table of contents...you should be able to page through the entries marking which ones you want to read and in what order... Illustrations and diagrams should also have their own liking...give the electronic book a speech processor - a good one, so that our computer can read the book to us." (Mead) Another writer has suggested that "The aesthetic needs of the book lover are most likely to be served by making the chip-readers themselves pleasant to look at and to touch-binding them in leather with gold clasps and with the display screens elegantly framed and mounted..." (Evans 108)

Other developments currently underway could have far-reaching effects on the future of the book. Ted Nelson's Xanadu vision of a "universal literary system" is taking shape as the Xanadu Operating Company, formed in April 1988 as a subsidiary of Autodesk, where Nelson is Distinguished Fellow. An article published in October 1990 noted "...that within months the Xanadu Hypermedia Information Server will offer the first document filing system software to support all forms of digital data (text, graphics, video and audio) with two-way hypertext links for branching to and from points of interest (also flexible 'span-links' between groups of links)..." (Ditlea)

Since the publication in the early 1980s of William Gibson's novel Neuromancer, the concept of "virtual reality" created by a combination of hard- and software has begun to take shape in a few research laboratories and small commercial firms. This "virtual reality" allows the user to enter a total electronic environment much as if he had stepped out of the audience and into a film or television program. (Goldstein; Helsel; Rheingold, 1990; Rheingold, 1991) The experience was predicted succinctly in 1970: "There will be total-environment bookrooms where words, sights, smells and sounds are all blasted at the reader..." (Spectorsky 62) This notion has already prompted Timothy Leary to declare "...that Huckleberry Finn...might be better presented as a virtual reality video in which viewers could twist the plot to suit their fancy. He exulted that the archaic nuisance of reading actual words could be eliminated!" (Martin)

All of these developments - from electronic books to Xanadu and virtual reality - promise both an exciting and challenging media future. But exactly where will the word, the book - the text - fit in? Alan Kay asks,

> Do you know why books today are the size they are? Because that was the size of a saddlebag back then. Aldus was the first guy to realize these things were not imitation manuscripts. You could build a lot of them cheaply, and you could take them away with you. They weren't going to be in institutions anymore. This is one of my favorite metaphors for what the computer has to be to really make it. You have to get the thing in the saddlebag. (Sobel 84)

WHAT OF THE FUTURE?

The number of predictions over the past three decades about the future of the book and the storage and transmission of text may equal the number of books published during the same period. The presence of microforms persists in a few scenarios. (Spectorsky 53; Rosen 424; Line 34; Harmon 113). The rise of fax was predicted by Clapp in 1955. (Clapp 79) Numerous writers feel the book and print-

on-paper will remain as one of many formats, just as in the past other forms of communication - speech, drawing, motion pictures, sound recordings, microforms, television, radio-have entered the culture without supplanting any of the others. (Winger 23; Clapp 77; Lacy, 1957, 340-343; Meadows 157-158; Spectorsky 53-54; Lacy, 1987, 255; Berry 151-152) Others see a continuing dominant role for the content, the text, although the format of its transmission may radically change - as they have in the past. (Goodrum and Dalrymple 163; Bronk 134; Asheim 104; Bailey 25) The future of books and libraries has also been extensively explored in a number of science fiction novels and stories. (Griffen)

One prophet sees the book's future in rosy terms: "But the factor most likely to assure the survival of books into the future is perhaps so obvious that it is easily overlooked. There is simply no experience in life that matches silent reading... But we must remember that the market for books - indeed for writing of any kind - was small until quite recently. The prospect that it may shrink again need not mean that books will disappear. Fewer books may mean better books." (Jennings 9) Jennison agrees: "Books will be the buffer between the individual and the world. A book is written by one man and can be experienced privately as little else can. Books will be more and more cherished as individual acts of private person-to-person dialogue. Reading will provide a gratification not otherwise possible in the contemporary submergence in sight and sound." (Jennison 150) Perhaps the current interest in hand-made crafts in this age of mass-produced goods is a paradigm for the future of the book.

Another pundit states flatly, "...the 1980s will see the book as we know it, and as our ancestors created and cherished it, begin a slow but steady slide into oblivion." (Evans 106) A third sees print as persisting, but primarily for ephemeral uses: "...the printed butterfly will emerge from its electronic chrysalis, but it will

also return again to it in due time..." (Line 35) Winger predicts, "The question of the future of the book is not so much one of its usefulness as it is one of getting at its contents... The future of the book is tied to these efforts to make the book more useful." (Winger 24) George Steiner is morose about the book's prospects:

> Not one among us in the book industry can say with any confidence what will happen to the book as we've known it in the imminent age of the word processor, the microfiche, the memory bank on a scale scarcely conceivable, retrieval techniques of a precision and comprehensiveness we can only imagine, the storage and transmission of texts by lasers at speeds far beyond those of even fourth-generation computers today, and so on. There is not an aspect of reading, writing, distributing texts which will not be touched by these extraordinary processes... It may well be...that the privately owned book, in a format such as we know it...will become a luxury object. It will become an article for special use, as were the hand-copied manuscripts which appeared after Gutenberg. (Steiner, 1987, 47)

Why the book may become merely an obsession for collectors or the nostalgic in future generations is illustrated by an anecdote Goodrum and Dalrymple describe.

> In our own household the question arises: How large is the Los Angeles metropolitan area now? The father goes to his study to consult the World Almanac, and the son goes to his room to call up CompuServe on his computer screen. Each gets the answer in approximately the same time, but the son is surprised. It never occurred to him that something like that "might be in a book." It was a statistic, it had to be updated regularly; he thought it would only be in a computer. Each year there are more citizens like the son, fewer like the father. (Goodrum and Dalrymple 157)

In the future, most people may be astonished that information or entertainment - even wisdom - "might be in a book." "The future of books is still linked with the future of human values." (Lacy, 1976, 120)

Possible futures for the book might be illuminated by consideration of the book's cultural role in the past. "The significance of permanent data storage is the prinicpal and perhaps sole reason why man is so absolutely the dominant creature

of the planet." (Evans 104) Man's methods of "permanent data storage" have been numerous and flexible. "When the papyrus scrolls were used to carry around on journeys and to read on shipboard, the scrolls became smaller and more compact than their ceremonial predecessors. When the reference use of the book became important, the vellum docex replaced the papyrus scroll. When...the demand for books from more people increased, printing on paper replaced the manuscript on vellum. Without losing the characteristics of being a portable, graphic record of language, the book has from time to time undergone the most radical changes in format and method of issue...to meet...varying needs." (Winger 25)

These various storage methods have not only served man's immediate needs. The "...capacity of the book to store knowledge through unresponsive ages..." (Winger 21) means that past thought and research can make an impact far beyond its original time of creation and recording. During the past five centuries the printed book has served that function well. "Print made possible rapid, wide sharing of the new knowledge...the leap of knowledge that came in the sixteenth and seventeenth centuries was both print-born and print-borne." (Lacy, 1987, 117) Now, as a result of changes in printing and paper-making technologies since 1800, our culture is awash in printed books. "Each of our major religions is a religion of the book... Our education has been built around books. The structure of our political life rests on our books of law, history... The very omnipresence of books leads us to underestimate their power and influence...the power of the book has been uncanny, mysterious...infinite...we see books everywhere, of every conceivable variety, in homes and schools, in offices and workshops." (Boorstin 359-360)

Despite the vast changes in communication and storage technologies throughout the 20th century, books persist, perhaps because "...the way we

perceive external reality through the audiovisual media is a quite different process from that of perceiving it through the medium of print..." (Lacy, 1987, 121) despite the fact that "The exclusive role of print to provide the reality that lies beyond personal experience has been shattered forever." (Lacy, 1987, 120) Yet "It is simply impossible for any idea or information to be conveyed by print without both author and reader having thought intensively about the message." (Lacy, 1987, 123) Print allows for a contemplation that is impossible to find in the flood of mass media products or the vast web of electronic databases. (Lacy, 1987, 125) Printing in multiple copies has given the author an audience far beyond what his own voice or a few manuscript copies could provide. (Winger 22) New ideas not immediately appealing to a mass audience can work their way over time into the cultural fabric through printed works. (Lacy, 1957, 362-363) The number of ideas that print can convey relative to other media is staggering; "...the content of a single issue of the New York Times covers far more than a week's television news programming..." (Lacy, 1987, 124) "When you look over a bookstore... Thousands, millions of ideas confront you; almost too many to cope with...something like the richness of life itself..." (Downs 2273)

"Yet the functions of print are changing...reading is no longer the main, indeed almost the only, way of extending personal experience." (Lacy, 1987, 121) Over the past decade technologies such as cable television, videocassette recorders, portable audio cassette and CD players and computers have extended flexible, responsive nonprint media into areas of an individual's life in ways beyond what film, radio and television did in the past. The discussion groups and electronic documents available over such networks as CompuServe, Bitnet and Internet make even a well-stocked magazine rack seem poor in ideas. "The book, a form, no longer works for all categories of information which we cherish and, as a

form, is clearly attempting to perform functions which are beyond it... Let us take...the telephone directory...[which] until now...has operated within the Gutenbergian mode, the number of copies growing with the number of anticipated users. The idea has simply exhausted itself and is crying out for a return to the manuscript mode, the single copy of valid information from which the individual extracts the pieces of information which are required." (Smith 62-63) Denney some years ago noted "...the compulsive piety about print, the agitated defense of print versus other media..." (Denney 99) "Had we had wire recording in the days of the Greeks, we might not now have to rely on biased secondhand reports for our knowledge of the philosophy of Socrates." (Asheim, 1955a, 4)

Our relationship to the functions the printed book has served in the past may be changing. Matters related to access and manipulation as well as many kinds of learning can now be better performed by computers and/or video. Entertainment is no longer limited to print and oral or group activities as it was before this century. The print world may "...continue to grow, but will form a smaller part of the overall communications environment. Such a change is not new. It has been in progress for much of this century." (Sigel 30)

We must remember that our response to print has never been monolithic. "...it is surprising how different it feels to read Milton and Hobbes in seventeenth- and twentieth-century printed editions." (Line 34) A reader of the King James Bible and one of Jane Fonda's Workout Book may appear to be engaged in the same activity, but the experiences - and the needs behind those experiences - are vastly different. Lane Jennings of the World Future Society has observed that young people totally absorbed in video games "...are doing...what their parents did in books - building characters and scenes in their own minds, 'surrogate memory experience.'" But the young may be "...turned off by books because a book has

become passive: the reader can't do anything different with the characters." (Goodrum and Dalrymple) Those of us nurtured in the world of print may view books in relation to mass media "...as individual acts of private, person-to-person, free choice communication..." but a vastly different point of view is now possible.

> ...the greatest impact of the database is the same as that of the legal and factual services: they are training generations of students to think in terms of words and numbers being available faster, more conveniently, and even more accurately on computer screens; they are subtly implying that printed books are more likely to be out of date, more clumsily indexed, harder to use, and even more biased than the digital. The digital data is believed to be "public, institutional, carefully checked"; a book over a single author's name is perceived as containing his personal views and data, limited, possibly already superseded, and maybe unverified. (Goodrum and Dalrymple 158)

In a future where the functions and authority of print have migrated to other media, what will be left for the book to do?

> ...it is by no means certain that some modified form of literature, by whatever name, will continue to exist in the postindustrial, post-Gutenberg future. There is always the possibility that literature was so much a product of print culture and industrial capitalism, as bardic poetry and heroic epic like Homer were of tribal oral society, that like chivalry in the age of gunpowder, it will simply disappear in the electronic age, when people get their information from television and databases. Or it may dwindle to a ceremonial role, something like Peking opera. Literature considered as universal imaginative writing, to be found in all times and all cultures, was, after all, a historical event, appearing as a cultural concept only in the late 18th century, and then only in the West, where it replaced aristocratic poetry. There is no reason why it should not join many other past cultural institutions in history's dream-dump when people get their amusement and information elsewhere. (Kernan)

Any consideration of the future of the future of the printed word as a cultural form must confront the different nature of the "text" in the electronic climate. Despite its changing transmission formats over the centuries, information survived intact in its recorded form as long as the cave wall, clay tablet, papyrus roll, manuscript codex or printed book lasted as a physical object. The advent of sound

and film recording over the last century created formats more malleable than any previously used by man. Tape recordings can be cut, spliced and rearranged in such a way that the changes become invisible to the user. If a manuscript is copied over or type reset with additions or deletions, the changes can be easily found as long as originals survive. Thus the integrity - and the authority - of the "text' can be maintained. especially with print.

Electronic, digital media increases the instability of tape to an even greater degree. The "text" "floats" (Kernan), being formed from electrical impulses "written" on a disk or chip. These impulses can be rearranged in infinite permutations without creating a permanent record or multiple copies at any stage. Digital data storage is thus highly unstable and returns our information resources to the limited number of copies of the manuscript period and the transitory level of oral cultures.

Past communication forms have also been viewed as ephemeral. "Unless you catch the TV program at the hour at which it is scheduled, you are likely never to see it. Unless you notice the paperback during the one week it is at the corner drugstore, you will probably never have an opportunity either to buy it or even know of its existence." (Clapp 77) However, as the video release of numerous old television programs and the current reprint career of paperback novelist Jim Thompson demonstrate, much of what was viewed in 1955 as transitory has actually been preserved quite well. Preservation of digital data presents altogether different problems, a graphic example of which is the huge collection of computer tapes made for NASA since the 1960s from satellite and interplanetary probe communications. The computers for which these tapes were intended are now obsolete, and operating models are difficult if not impossible to locate. Many of the tapes have been poorly stored, and degradation of their contents has occurred.

Since these tapes are "editions of one," no alternate copies exist to which one can turn.

Lanham describes further problems with "text" in the electronic world. That "text" takes on characteristics similar to that given music by electronics: "...both composers and performers have been given an enormous repertoire of recorded sounds to play with, reform, and collage, - vast library - usually built into...an electronic keyboard when you buy it..." (Lanham 32) "What would such an electronic text look like...we must begin by saying...[it] cannot be...a book at all, and that we have as yet no word for the multi-media entity into which it has metamorphosed. And the conception of 'text' is so different from print that we probably need another word for it, too. And the 'reader' - his or her role differs so from a print reader that we need a new word here, too. Both 'author' and 'authority' become softened and diffused as the reading event moves from a one-time exchange to a continuing conversation. Our next text-non-book will be 'published' in a different way, too. It will by dynamic, open-ended information system, critiqued and updated on a daily basis by its users, both local and distant, both teacher and student... Such systemic textbooks will grow, take on local coloration and emphasis, mutate into new forms of collective cultural enterprise, as they become part of that gigantic structure of 30,000 electronic billboards already out there..." (Lanham 36) "The electronic reader, unlike the printed one, can interact with the text and change it, rearrange it with subheadings to make it clearer or suit the immediate purpose...intersperse it with a commentary no longer marginal but as central as the canonical text itself..." (Lanham 34). "The whole of Aristotelian poetics is pretty much stood on its ear by a changeable, interactive, and non-linear text which has no final beginnings, middles and endings..." (Lanham 38)

A recent book edited by Delany and Landow, Hypermedia and Literary Studies, illustrates how elastic the electronic "text" is already becoming. Mind-boggling chapter titles include: "Reading and Writing the Electronic Book; Reading from the Map: Metonymy and Metaphor in the Fiction of Forking Paths; Biblical Studies and Hypertext; Ancient Materials, Modern Media: Shaping the Study of Classics with Hypertext; Linking Together Books: Adapting Published Material into Intermedia Documents; and Hypercard Stacks for Fielding's Joseph Andrews: Issues of Design and Content." "[T]o digitize cultural texts is to desubstantialize them..." (Lanham 41) As Compaine has noted about books, "We have learned how to use them..." (Compaine 136) and the kind of intuitive and rapid assimilation that children have learned with video games may become the cultural skill needed for the electronic world.

Naturally this electronic region will present advantages, problems and challenges for libraries, scholarship, preservation and publishing that will dwarf anything faced thus far. As libraries become less the collectors, organizers and protectors of the stock of knowledge, and more the nodes where access is provided to remote "texts," who will insure the authority of our textual cultural inheritance? (Clapp 82; Neavill) Bibliographic control is difficult enough in the print environment; the past few decades have brought an explosion of small press publications, the "underground" press, "fanzines," conference and report literatures that form a vast pool of "fugitive" documents. Electronic technology is now creating a "...tidal wave of self-published works...[that]...place great strains on the system of bibliographic control." (Neavill 87) Already "Bulletin board users are 'publishing' - making reputations, acquiring audiences - on their local screens." (Goodrum and Dalrymple 159) Users of national networks like CompuServe are developing much more than local audiences. Ted Nelson is working on Public

Access Xanadu, and proposes franchised "...Silverstands, information stands that are the equivalent of McDonald's, where billions of documents are served..." (Ditlea) This sort of kiosk distribution has been previously suggested for paperbacks (Sigel 28-29) and in-home access (Shneour).

Libraries have been viewed by some as being as much a part of the problem as the solution in regard to the future of the book. (Thompson) In 1958 Powell complained "...that American librarianship has been dominated in recent years by those who have no real interest in books..." (Powell 349) What would he say about the cadres of systems analysts now on so many library staffs?

Perhaps both libraries and publishers will move beyond the distribution and custodianship of information. In the future publishers may be "'...delivering information into a process being conducted by the reader,'" says Paul Saffo of the Institute for the Future. (Koenenn, 1989b) John Seely Brown, director of Xerox's Palo Alto Research Center, sees future libraries as "collaboratories," "...a center of design...[to] enable people to share their ideas." (Schrage) But no matter how rosy the predictions, the nagging issues of textual authority and preservation remain.

In his essay "After the Book?" George Steiner responds to the query of his title, "It is like us to ask such questions... We are fascinated by 'last things,' by the end of cultures, of ideologies, of art forms, of modes of sensibility... If we pose the question of the viability of the book, it is because we find ourselves in a social, psychological, technical situation which gives the question substance." (Steiner, 1978, 186-187) Almost two decades earlier Asheim foresaw the coming problem just as clearly.

> The reality is that the printed book seems already to have been partially replaced. In the scholarly field it is often no longer the book itself which is consulted but a substitute for the book, such as a photostat, a miniprint, a microfilm, or a Microcard. In the popular field the invasion is even more

> troubling, because such inventions as the moving picture...definitely supplant the book instead of merely altering its external form... The death of the book is more likely to be hastened by those who adamantly insist on retaining, for twentieth-century purposes, the nineteenth-century form of the book... For there is nothing eternal and God-given about the format and dimensions of the book as we happen now to know it... (Asheim, 1955a, 3)

We have reached such a cusp of change that one author, writing in 1980 in a book titled The Future of the Printed Word would announce, "In this book, the expression printed word is construed, very broadly, to include words in any kind of display: paper, microforms, CRTs, plasma panels and so on. When we construe the term in this sweeping way, it is obvious that the printed word has a long future...people will still be reading..." (Strawhorn 24) If all the advantages of the printed words of the past can be absorbed by these "printed words" of the future, so be it. But if not, perhaps we'll rediscover Heathorn's "...new device...known as Built-in Orderly Organized Knowledge. The makers generally call it by its initials, BOOK... Anyone can use BOOK, even children, and it fits comfortably into the hands..." (Heathorn)

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